

patients usage; 3) Analyze adherence pattern at country level, based on medication consumption; and 4) Estimate the impact of adherence in the treatment costs. **RESULTS:** Medication for MS was responsible by 12.9% of high cost medication supplied by Public Sector in Brazil. During the period of analysis an average of 34.4% of patients adhere to treatment from 10 to 12 months. Patients treated were distributed among therapeutics alternative as follow: 60.66% to interferon-1a (two brands), 20.5% to interferon-1b and 18.85 to glatiramer acetate. It was possible to detect an increase in drugs association. We found the following adherence per treatment: 36.9% to glatiramer acetate, 33.67% to interferon-1a (two brands) and 32.3% to interferon-1b. Due to these levels of adherence the annual costs per patient treated was USD 27,824 to glatiramer acetate, US\$42,151 to interferon-1a (two brands) and US\$34,038 to interferon-1b. Total treatment costs was higher than USD92 millions per year (R\$2.5 / USD1.0), the distribution of costs begins to diverge from patients distribution due to combination therapy. **CONCLUSIONS:** National guidelines standardize care, but the analysis of treatment patterns points to low treatment adherence. Due to actual levels of adherence the costs per patient treated was three times higher than the expected. Actions taken to change these levels will have a considerable impact to reduce the cost per patient treated.

URINARY/KIDNEY DISORDERS – Clinical Outcomes Studies

CHARACTERIZATION OF IMMUNOSUPPRESSIVE MEDICATION USE IN KIDNEY TRANSPLANTATIONS IN ACADEMIC MEDICAL CENTERS

Kapur S¹, Matuszewski K², Oinonen M¹

¹University HealthSystem Consortium, Oakbrook, IL, USA, ²University HealthSystem Consortium, Oak Brook, IL, USA

OBJECTIVES: The objective of the study was to characterize variance in the utilization of immunosuppressant agents among kidney transplant patients across academic medical centers (AMC), and to illustrate potential differences in clinical and economic outcome measures. **METHODS:** A retrospective database analysis, representing 48 AMCs participating in the University HealthSystem Consortium's (UHC) Clinical Resource Manager (CRM), was conducted on inpatients discharged between July 2007 and June 2008. Administrative data examined included total discharges for kidney transplants, source of renal allograft, cases with complications, immunosuppressant utilization, length of therapy (LOT), length of stay (LOS), days in intensive care unit (ICU), in-hospital mortality rate, estimated immunosuppressant cost, and estimated hospital costs. Descriptive statistics were used to evaluate data. **RESULTS:** The mean LOT and number of institutions utilizing particular agents varied. Cyclosporine was used in an average 16% of transplants. Tacrolimus and mycophenolate mofetil had a mean utilization of 83% (4% to 100%) and 92% (39% to 100%) respectively. Sirolimus and azathioprine were administered in an average 12% (1% to 75%) and 2% (<1% to 8%) respectively. Antithymocyte globulin, equine was dispensed in an average 28% (<1% to 91%) of cases. Antithymocyte globulin, rabbit was used in an average 53% (1% to 100%) of cases. Basiliximab and daclizumab were utilized in an average 31% (1% to 96%) and 33% (1% to 89%). Thirty-three institutions utilized three or more agents in greater than 50% of their kidney transplants. Agents that contributed most significantly to immunosuppressant cost were antithymocyte globulin and basiliximab. The mean LOS index was 1.1 (0.6 to 1.7). The mean days spent in the ICU was 2.8 (1.6 to 8.0) days. The mean in-hospital mortality rate was 0.47%. The estimated average immunosuppressant cost per case was \$4249. **CONCLUSIONS:** Considerable variation exists among institutional utilization of immunosuppressive agents, LOT, and associated medication costs per case.

RESTRICTED ACCESS TO DRUGS IS ASSOCIATED WITH LESS OPTIMAL MINERAL METABOLISM CONTROL IN HEMODIALYSIS PATIENTS

Mendelssohn D¹, Lebnner A², Soroka S³, Cournoyer S⁴, Da Roza G⁵, Geary D⁶, Beard K⁷, Folia C⁷, Ferreira L⁸

¹Humber River Regional Hospital, Toronto, ON, Canada, ²University of Western Ontario, London, ON, Canada, ³QEII Health Science Centre, Halifax, NS, Canada, ⁴Hôpital Charles LeMoine, Greenfield Park, QC, Canada, ⁵Fraser Health, New Westminster, BC, Canada, ⁶Hospital for Sick Children, Toronto, ON, Canada, ⁷Agro Health Associates, Burlington, ON, Canada, ⁸Genzyme Canada Inc, Mississauga, ON, Canada

OBJECTIVES: Abnormalities in mineral metabolism (MM) are associated with increased morbidity and mortality in patients with chronic kidney disease (CKD). PhotoGraphTM software was designed to allow dialysis centres to track MM and assess treatment efficacy. Recent studies in other patient populations have suggested that restricted access to drugs was associated with poorer patient outcomes in the Canadian health care setting. The aim of this study was to compare MM management among dialysis patients who live in provinces with open vs. restricted access to expensive drugs. **METHODS:** A sample of 50 Canadian dialysis centres which used PhotoGraphTM were selected. Phosphorus (P), calcium (Ca), intact parathyroid hormone (iPTH) and calcium-phosphate product (CaXP) were measured and compared between provinces with open and restricted access. Data were analyzed by phosphate binder type. **RESULTS:** MM targets were more likely to be reached by patients residing in provinces with formularies allowing more open access to non-calcium based phosphate binders: P: 61.6% vs. 54.9%; Ca: 59% vs. 44.8%; iPTH: 31.1% vs. 27.3%; CaXP: 85.4% vs. 76.9%. Patients residing in provinces with more restrictive formularies were more likely to receive doses of calcium that exceed the

maximum recommended in treatment guidelines (i.e., >1.5 g/day) than those with more open listings (62% vs. 15%). In addition, patients residing in provinces with restricted access to sevelamer were less likely to receive this drug (16.2% vs. 42%). **CONCLUSIONS:** MM was better managed among patients in settings with more open access to non-calcium based phosphate binders. There is a reasonable expectation that this may translate to better outcomes and reduced mortality among hemodialysis patients.

CALCIUM-BASED PHOSPHATE BINDERS LEAD TO INCREASED PROGRESSION OF VASCULAR CALCIFICATION IN CHRONIC KIDNEY DISEASE

Beard K¹, Folia C¹, Ferreira L²

¹Agro Health Associates, Burlington, ON, Canada, ²Genzyme Canada Inc, Mississauga, ON, Canada

OBJECTIVES: Cardiovascular disease is the leading cause of death among patients with chronic kidney disease (CKD). Vascular calcification (VC) is a common feature of CKD that predicts mortality and may contribute to future outcomes. CKD treatment guidelines recommend that calcium-based phosphate binders (CBBs) be restricted to doses of 1.5 g/day elemental calcium, however a previous study showed that this dose was associated with VC in CKD. Similarly, the use of calcium (<1.5 g/day) has been associated with poorer cardiovascular outcomes in other patient populations (e.g., postmenopausal women). The aim of this review was to compare the prevalence of VC among CKD patients treated with CBBs and sevelamer. **METHODS:** A literature search using Medline was conducted using the following terms: CBB, calcium carbonate, calcium acetate, non-CBB, sevelamer, lanthanum, vascular calcification, coronary and aorta. Studies reporting mean changes from baseline (%) in VC scores in CBB and sevelamer groups were used for data extraction. **RESULTS:** Increased progression of coronary calcification was observed in CBB groups as compared to sevelamer: 13.4% to 50.8% vs. -8.0% to 23.4% (n = 6 studies). Sevelamer was associated with regression of aortic calcification compared to CBBs: -71.3% to -13.4% vs. 5.7% to 135% (n = 3 studies). Average doses of calcium ranged from 1.39 to 2.3 g/day. **CONCLUSIONS:** Although the doses of elemental calcium used in these studies approached those recommended by treatment guidelines, CBBs were associated with increased progression of VC. CBBs are associated with increased VC, a predictor for mortality, even when calcium doses concur with current standards of practice. More research on the impact of CBBs on VC and future outcomes is required.

THE EFFECTS OF CALCIUM-BASED VS. NON CALCIUM-BASED PHOSPHATE BINDERS ON OUTCOMES AMONG PATIENTS WITH CHRONIC KIDNEY DISEASE: A META-ANALYSIS

Tsuyuki R¹, Beard K², Fitchett D³, Jamal S⁴, Lok C⁵, Mendelssohn D⁶

¹University of Alberta, Edmonton, AB, Canada, ²Agro Health Associates, Burlington, ON, Canada, ³St. Michael's Hospital, University of Toronto, Toronto, ON, Canada, ⁴Women's College Hospital, University of Toronto, Toronto, ON, Canada, ⁵University Health Network, Toronto, ON, Canada, ⁶Humber River Regional Hospital, Toronto, ON, Canada

OBJECTIVES: Two-thirds of patients with Chronic Kidney Disease (CKD) will die of cardiovascular disease (CVD). In addition, 30 year old dialysis patients have a 500-fold increased mortality risk vs. an age-matched general population. Coronary artery calcification (CAC) is a major risk factor for CVD in CKD patients. Increased serum calcium accelerates this process, which suggests that calcium-based phosphate binders (CBBs) may accelerate CAC and increase mortality. The aim of this systematic review was to determine the effect of CBBs vs. non-CBBs on all-cause mortality and CAC among patients with CKD. **METHODS:** We conducted a detailed search of several electronic databases (e.g., MEDLINE, EMBASE, CINAHL) using the following terms: kidney disease, phosphate binders, calcium dialysis, phosphate levels, CV events and mortality. Standard Cochrane methods for study selection and data abstraction were followed. We included nine studies which compared CBBs to non-CBBs. **RESULTS:** Fifty-seven articles were retrieved for detailed evaluation. Sevelamer was the only non-CBB noted in the nine trials which met the inclusion criteria. Sevelamer was associated with a trend towards reduction in all-cause mortality (RR 0.81; 95% CI 0.65–1.02), p = 0.07 vs. CBBs. Overall difference in change of CAC scores among those taking sevelamer vs. CBBs was -76.35 (95% CI -158.25 – 5.55), p = 0.07. **CONCLUSIONS:** Compared to CBBs, sevelamer is associated with a non-significant trend toward reduced all-cause mortality. This is concordant with the trend toward a modest reduction in CAC progression with sevelamer. Since CBBs are used frequently in CKD patients, this systematic review highlights the need to further evaluate the safety of CBBs in this high-risk population.

COMPARISON OF LIFE EXPECTANCY, EXPECTED YEARS OF LIFE LOST AND SURVIVAL BETWEEN HEMODIALYSIS AND PERITONEAL DIALYSIS PATIENTS

Kao TW¹, Huang JW², Hung KY², Chang YY¹, Chen PC¹, Yen CJ², Chen YM², Chu TS², Wu MS², Tsai TJ², Wu KD², Wang JD¹

¹National Taiwan University, College of Public Health, Taipei, Taiwan, ²National Taiwan University Hospital and National Taiwan University College of Medicine, Taipei, Taiwan

OBJECTIVES: This study aimed to compare the life expectancy, expected years of life lost (EYLL) and survival between patients under hemodialysis (HD) and peritoneal dialysis (PD). **METHODS:** Adult patients who underwent maintenance dialysis at National Taiwan University Hospital from 1995 to 2006 were followed-up until the